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VII. *Some Microscopical Observations of vast Numbers of Animalcula seen in Water by John Harris, M. A. Rector of Winchelsea in Suffex, and F. R. S.*

July the 7th, 1694.

**I** Examined a small Drop of Rain Water, that had stood in a Gally-pot in my Window for about two Months. I took it (with the head of a small Pin) from the discoloured Surface of the Water, and in it I observed four sorts of Animals. In the clear part of the Drop were two Kinds, and both very small. Some were of the Figure of Ants Eggs; these were in continual Motion, and that very swift: And I find that this kind of Oval Figure is the most common to the *Animalcula* found in Liquors. The other sort that were in the clear part of the Drop, were much more oblong; about three times as long as broad; these were exceeding numerous, but their motion was slow, in comparison of the former.

2. In the thick part of the Drop (for the Water from whence I took it had contracted a thickish skum) I found also two sorts of Animals, as a kind of Eels, like those in Vinegar; but much smaller, and with their extreame more sharp; these would wriggle out into the clear part, and then suddenly betake themselves back again, and hide in the thick and muddy part of the Drop, much like common Eels in the Water. I saw here also an Animal like a large Maggot, which would contract it self up into a Spherical Figure, and then stretch it self out again; the end of its Tail appeared with a *Forceps*, like that of an *Ear-wig*; and I could plainly see it open and shut its Mouth, from whence Air bubbles,

bubbles, would frequently be discharged. Of these I could number about four or five, and they seemed to be busie with their Mouths as if in Feeding.

These four Kinds of living Creatures I found afterwards also in many other Drops of the same corrupted water, (*i. e.*) in its *Film* or Skum, which was on the Surface, for under that, in the lower parts of the Water I could never find any Animals at all, unless when the Water was disturbed, and the Surface shaken down into, and mingled with the lower parts.

April 27th, 1696.

3. With a much better Microscope I examined some Rain Water that had stood uncovered a pretty while, but had not contracted any such thick and discoloured Skum, as that before-mentioned had. In this, where it was clear, I could not find any Animals at all; but a little thin white Skum, that like Grease began to appear, in the Surface I found to be a *Congeres* of exceeding small *Animalcula* of different shapes and sizes, much like those produced by steeping Barley in Water.

4. At the same time I look't on a small Drop of the Green Surface of some Puddle-water, which stood in my Yard, this I found to be altogether composed of Animals of several Shapes and Magnitudes; But the most remarkable were those which I found gave the Water that Green Colour, and were Oval Creatures, whose middle part was of a Grass Green, but each end Clear and Transparent. They would contract and dilate themselves, tumble over and over many times together, and then shoot away like Fishes: Their Head was at their broadest end, for they still moved that way. They were very Numerous, but yet so large, that I could distinguish them very plainly, with a Glass that did not magnify very much. Among these were inter-  
sperfed

perfed many other fmaller and transparent Animals, like thofe mentioned but now, as found in the whitifh skum that was on fome Rain-water, which had flood a while uncovered.

*April the 29th, 1696.*

5. I found another fort of Creatures in the Water (fome of which I had kept in a Window, in an open Glafs) They were as large as three of the other, with the Green border about their Middles, but thefe were perfectly clear and colourlefs.

6. Then alfo examining more accurately the Belts or Girdles of Green that were about the Animals, mentioned above, I found them to be compofed of Globules, fo like the Rows or Spawn of Fifhes, that I could not but fancy they ferved for the fame ufe in thefe little Creatures: For I found now fince *April 27.* many of them without any thing at all of that Green Belt or Girdle; others with it very much, and that unequally diminifhed, and the Water filled with a vaft number of fmall Animals, which before I faw not there, and which I now looked on as the young Animated Frye, which the old ones had fhed. I continued looking on them at times, for two Days, during which time the number of the Old ones, with the green Girdles, decreafed more and more; and at laft I could not fee one of them fo encompassed, but they were all clear and colourlefs from end to end.

*May the 18th, 1696.*

7. I look't on fome of the Surface of Puddle-water, which was blewifh, or rather of a changeable Colour, between Blew and Red: In a large quantity of it I found prodigious numbers of Animals, and of fuch various bigneffes, that I could not but admire their great number and variety; but among thofe were none with thofe Girdles before-mentioned, either of Green, or any other Colour.

8. I

8. I then also examined the Surface of some other Puddle-water, that lookt a little greenish ; and this I found stockt with such infinite Numbers of Animals, that I yet never saw the like any where but in the *Genitura Masculinâ* of some Creatures. Among these there were very many of a greenish Colour ; but they all moved about so strangely swift, and were so near to each other, that tho' I tired my Eyes, I could not distinguish whether the green Colour were all over their Bodies, or whether it were only round their middles in Girdles, as before, but from the roundness of their Figure and their smallness, I judge that they chiefly consisted of the young animated Spawn of that kind of Animals I mentioned (p. 4.) I found that the point of a Pin dipt in Spittle would presently kill them all ; as I suppose it will other Animalcula of this kind.

9. The same Day also I look't on the Surface of some Mineral (Chalybeate) water, which had stood in a Viol unstopt for about three Weeks : In it I saw two kinds of Animals ; one exceeding small, and the other very large : which latter sort had on the Tail something that lookt like Fins : There were but very few of either sort.

The compounded Salt or Vitriol of the Water was shot into pretty Figures, but all irregular. They look't like a small heap of little Sticks, laid across each other at all Angles and Positions, only they were transparent, and a little greenish as Chrystals of a Chalybeate nature use to be.

10. I have infused *whole Pepper Corns, Bay berries, Oats, Barley and Wheat* in Water, whose Skum, after two or three Days hath afforded Animals, as hath been often already found by others, at least as to some of them : But I found the greatest Numbers and variety in

*Qq*

*Wheat*

*Wheat* and *Barley-water*, and the fewest in that wherein *Bay-berries* had been steeped.

How such vast Numbers of Animals can be thus (as it were at pleasure) produced, without having recourse to Equivocal Generation, seems a very great difficulty to account for. But tho' the solving of it that way makes short work of the matter (for 'tis easie enough to say they are bred there by Putrefaction) yet the asserting Equivocal Generation, seems to me to imply more absurdities and difficulties, then perhaps may appear at first sight: I wish therefore, that this matter would a while imploy the thought of some ingenious and inquisitive Man. In the mean time I've Conjectured, that these *Animalcula* may be produced by one or both of the following ways.

1. I have thought that the Eggs of some exceeding small insects, which are very numerous, may have been layed or lodg'd in the *Plicæ* or *Rugæ* of the Coats of the Grain, by some kinds that inhabit on those Seeds, as their proper places. For that Insects of the larger kinds, do frequently thus depofite their Eggs, on the Flowers, and Leaves of Plants, are often experimented; and 'tis very probable, that the smaller or Microscopical Insects do the same. Now these being washed out of the Seeds, by their immersion in Water, may rise to the Surface, and there be hatcht into those Animals which we see so plentifully to abound there.

2. Or the Surface of the Water may arrest the stragling Eggs of some Microscopical Insects, that perhaps were about in the Air, and Being fitted and prepared for this purpose, by the Infusion of proper Grain, or a proportionable degree of Heat may compose so proper a *Nidus* for them, that they may, by the warmth of the Sun be easily hatcht into living Creatures; which its probable

probable [like the strange Water Insect, from whence a Gnat is produced, mentioned by the Learned Dr. *Hook* in his *Micrographia*, whose Metamorphosis I have often with pleasure seen] may afterwards turn into Flies or winged Insects of the same species with the Animal Parent. And perhaps sometimes *both* these Circumstances, and *others* of the like Nature, concur for their Production.

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## Account of a BOOK.

Parochial Antiquities, *Attempted in the History of Ambrosden, Burcester, and other adjacent Parts in the Counties of Oxford and Bucks.* By *White Kennet*, Vicar of *Ambrosden*. At the Theatre in *Oxford*, in 1695. in 4°.

**T**HIS Book is the first of the Kind that has been Published, either in our own Language, or in any other that I know of. The Author (who has formerly Published *Somner's Life*) has pursued the following Method.

I. He has given us an Account of what Footsteps he could discover of the several Inhabitants of this Island, before the *Norman Conquest*, within the Bounds of those Parishes, which he propos'd to treat of.

As of the *Britains*, Chap. 1.

*Romans*, ————— 2.

Garrisons, 3.

Coins 4.

High-ways 5.

Customs 6.

*Saxons* ————— 7.

*Danes* ————— 8.

*Saxons restored* 9. Qq 2

II. From